

More Than Wires, Pipes and Ducts: Some Lessons from Grassroots Networked Communities and Master-Planned Neighbourhoods

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Abstract. Community informatics research has indicated that the provision of technical connectivity in local neighbourhoods alone does not ensure community interaction. Externally initiated projects applied to communities by government or commercial bodies have encountered difficulties where the project's goals do not correspond to the host community's purposes. Differing expectations can lead to disillusionment or rejection. Self-organised initiatives developed from within communities appear to be more aligned with residents' goals and purposes and may not face these issues. However these initiatives have also encountered difficulties in maintaining volunteer input and achieving technological sustainability. Valuable insights can be drawn from both cases. In this paper we review examples of each type of initiative and consider lessons that can be taken forward to new networked neighbourhood initiatives currently being developed. We consider one specific example, an inner-city master-planned residential development in Australia seeking to establish a community association to support socio-economic sustainability and governance of the local ICT infrastructure. We offer recommendations drawn from existing projects that may be applied to this site and to a wider context, and consider some implications for the future selection, deployment and maintenance of community information systems.

Keywords: community informatics; community information systems; community networks; grassroots communities; networked communities; master-planned communities; urban neighbourhoods; ICT

1 Introduction

The design and development of technological solutions to facilitate social communication and interaction between residents in urban populations is an increasingly important aim for many countries around the world. In this paper we consider Australia and the UK which are particularly prone to issues that stem from

regional migration, socio-cultural diversity, urban renewal and increasing densification. Such trends are also evident in other urbanised areas around the world, and both the private and public sector are looking at ICT to take on a mediating and facilitating role to remedy some of these issues. Social isolation and 'non-connectedness' have high social and economic costs (DCITA, 2005). ICTs that enable the formation of community networks can help bring collocated people together socially and create safe and secure neighbourhoods. Ways to facilitate such social networks and increase awareness of individual and community skills and assets may foster social cohesiveness and well-being. Community networks can also assist local and state government efforts to support access to local information and services as well as encourage public consultation, civic engagement and open debate.

Australia and the UK are two of the most urbanised countries in the world in terms of the high proportion of urban dwellers among its total population. In Australia approximately two-thirds of the total population reside in major cities (Australian Bureau of Statistics, 2004). Current projections for South East Queensland (SEQ) are 3.71m residents by 2026, an increase of around 1.05m people, or almost 50k each year on average (Queensland Government, 2005, p. 5). The continuation of the low density urban sprawl in many areas of the world is not sustainable. These trends have global economic relevance and reflect the changing role of cities internationally. Compact city policies are being developed and implemented in many capitals to deal with population pressures and urban expansion.

The increased population density generates rising demand for ICT infrastructure and services to enable social communication and interaction between urban residents. Internet cafés are a familiar sight in urban centres, mobile phone reception is approaching near full coverage of inner-city areas, and wireless Internet services are being rolled out to facilitate ubiquitous and pervasive computing globally. Surprisingly, despite the fact that urban centres are possibly better connected than they have ever been before, notions of anonymity and urban alienation are still being discussed in urban planning and policy making. What does an 'urban community' or an 'urban village' look like in the 21st century? Randolph (2004, p. 483) argues that:

“the language of community has come back with vengeance in policy areas that ignored it for many years. Cities are becoming, perhaps more than ever before, collections of distinctive communities and neighbourhoods, all the more differentiated as the cities grow in size and complexity. As the city expands, people remain focused on their small part of it”.

Randolph's more contemporary image of community is consistent with Wellman's notion of networked individualism (Wellman, 2001) which reflects the inherent tension between the collective group networked by means of ICT and the individual who wants to stay in control of their social circle – their 'small part of the city'.

The plethora of opportunities that arise from a wider uptake of digital technology and the Internet are being recognized both by the public sector such as government bodies (Cabinet Office, 2005; Commission of the European Communities, 2005), private entities such as telecommunication carriers and by individual researchers and activists. The demand of the computer literate and technology-savvy drives the provision of ICT infrastructure and services. However, the notion of digital divides

exists in urban areas as it does in rural communities and developing countries. Lack of access to ICT can have far-reaching effects and may be a significant part of enabling full participation in a contemporary society (Hopkins, 2005; Meredyth *et al.*, 2004; Selwyn, 2004). Social exclusion can result from a lack of computer literacy, from inadequate means to access the ICT infrastructure of a city, or from personal preferences to reject new forms of network communication (Preece *et al.*, 2004; Selwyn, 2003).

However, scholars such as Gurstein (2003) argue that the provision of access itself is necessary but not sufficient to address all levels of inequality people face. DiMaggio and Hargittai argue that rather than simple access, multiple inequalities must be overcome to ensure meaningful usage (DiMaggio and Hargittai, 2001). The combination of means to ensure both access to connectivity and the effective use of information and services is key to solving inequalities and realise the potential benefits of a 'connected society'. Research and development of community networks for residents of urban neighbourhoods are one possible strategy which has been taken up by a variety of projects in Australia and the UK.

Simply providing connectivity and electronic access by for example setting up online portals and discussion boards does not mean that community members will participate in them and automatically become a community. Yet many externally initiated projects to date have been built with the assumption that 'if you build it, they will come'. This approach has in most circumstances resulted in systems that lack meaningful interactivity and approaches that assume local willingness to participate. Although they may provide useful community information and services, the ability of such systems to connect residents with each other is usually limited. As such they are sometimes seen as 'yet another burden' instead of a helpful communication tool which integrates seamlessly into the existing communicative ecology of social networks which residents form with other friends and peers: there is the possibility of residents being "digitally disengaged" as well as "digitally excluded" (British Telecom, 2004).

Grassroots developed, self-organised initiatives on the other side are driven from within existing local communities. They develop their own internet access and network infrastructure with minimal external support to enhance communication and sense of community within their geographically defined boundaries. They may benefit from a greater sense of ownership due to their local control and management from within the neighbourhood, but may also face difficulties in providing a meaningful, long term sustainable community network service to their locality. Technical expertise is harder to maintain within a small community, and the social sustainability of a network run on little or no funds and dependent on volunteers may prove to be problematic.

In this paper we review a range of such projects to explore aspects of digital provision considering both externally initiated ('top-down' or 'master-planned') and self-organised ('bottom-up' or 'grassroots') community networks¹ and gather some

¹ We acknowledge that in reality there are shades of gray and the picture is not as black and white as we paint it here. The dichotomy is introduced here merely to enable a more comprehensible discussion.

lessons to inform the development of new community networks. Findings are set against the emerging requirements of an inner-city master-planned residential development in Australia seeking to establish a community association to support the medium and long-term economic and social sustainability and governance of the local ICT infrastructure.

2 Externally Initiated Community Networks

The most reported and researched community networks are those initiated and funded from external bodies such as universities and government departments. University researchers have been involved developing and supporting community networks since the 1970s and the Berkeley Community Memory (Farrington & Pine, 1996). Governmental enthusiasm to connect society and industry to the new 'communication superhighways' (Hearn *et al.*, 1998) raised concerns of a possible divide in access to information and communication technologies (Anderson, Bikson, Law and Mitchell 1995). This led to research in the form of widespread surveys (e.g. National Telecommunication and Information Administration 1995) and pilot projects to explore the effects of supporting connectivity. Key projects have included Netville in Canada (Hampton & Wellman, 2003), Blacksburg Electronic Village (Cohill & Kavanaugh, 2000) and Camfield Estates (Pinkett, 2003) in the USA, Ennis in Ireland (McQuillan 2000), Williams Bay (Arnold *et al.*, 2003) and Atherton Gardens (Hopkins, 2005) in Australia and the Wired Up Communities in the UK (Devins *et al.*, 2003). These projects have operated across a broad range of cultures and with a wide variety of circumstances but common issues have arisen.

Many externally initiated network communities have been run with a fixed timeline: actions are undertaken, data is collected and the project written up. In some cases the participants are aware of this limitation from the outset; for example by being offered free internet connectivity for a set period of time in the Wired Up Communities project (Devins *et al.*, 2003). In other cases this came as a complete surprise – in Netville, residents assumed they were receiving permanent internet connectivity as part of their house purchase and were upset when the technology consortium announced it had gathered its data and would be closing down the service (Hampton, 2003). Other projects may struggle to survive after external funding has finished and are forced to change their priorities and targets as a result (Qvortrup, 1994) leading to a failure to support the original clients.

Such a 'project based' approach to community networks may make them less socially sustainable – users may be encouraged to participate but then left unsupported and disenfranchised as a result. Day and Cupidi (2004) recommend that community technologies should be approached as open ended initiatives, rather than closed term projects, as the latter is detrimental to social sustainability. If a community network is to be of long term benefit it must be seen as part of the long term infrastructure and strategies designed around this assumption. Exit strategies must be formulated to ensure the network can continue after funding has finished; these should consider not only infrastructure funding but also community support, training, and staffing.

Externally initiated projects may suffer if they do not consider local social structures; while this is more significant in existing communities, new communities also rapidly develop social structures and these must be taken into account. In the Ennis 'Information Age Town' project (McQuillan, 2000), a wide range of technological applications were put into place alongside the information technology infrastructure. However in some cases these destabilised rather than developed social cohesion, for example, unemployed people were asked to now sign up for their unemployment benefits online rather than by visiting the town unemployment centre. While this may have sped up a clerical process, it removed an important social ritual for already isolated individuals within the community (Warschauer, 2002). Similarly, in one of the Wired Up Communities locations in the UK, low usage of a village telecentre was later found to be due to its physical location in a community venue that had been the central meeting point during a recent coal miners' strike. Such a politically charged venue would not be used by a significant number of the local residents for this historical reason (Halcyon Consultants, 2003). Both examples illustrate the need to consider the wider communicative ecology of the community and locale (Foth & Hearn, 2006, forthcoming).

Community networks are technologically complex; they offer services to a local neighbourhood that are comparable to a business IT department. In this aspect, externally initiated community networks often perform well. Budget is allocated for set up and support of the explicit aspects of the network – the devices and the communication infrastructure itself. Association with university technology researchers assures free or low cost technical support, for example as found in Camfield Estates (S. Davies *et al.*, 2003) or Blacksburg Electronic Village (Cohill & Kavanaugh, 2000). However such resources need to be available on a long-term open-ended basis, with strategies for continued support if the project has limited time period funding.

Projects may encounter 'social resistance' (Wright, 2005) with not all members of a locality interested in signing up to join the community network. This will have an effect on any network that seeks to be inclusive and providing a medium for all residents of a locality. While this problem may be encountered by both externally initiated and self-organised networks, externally initiated networks particularly have encountered difficulties of being perceived as being driven by external goals not relevant to the local community. This may lead to some members of the locality not being connected, or disconnecting, reducing the social effectiveness of such a network.

3 Self-Organised Community Networks

Since the earliest days of the internet, there have been local community based applications of network tools and services. Many of the early BBS (bulletin board systems) and Free-nets were started by innovators within local communities to support neighbourhood activities (Schuler, 1996) and this model has continued until the present. Similar to other earlier technologies such as the radio and the telephone, innovators and early adopters within communities have appropriated the new

technologies for their own uses, either as a response to lack of provision, adapting inflexible exogenous framings of technology, or innovating for their own purposes (Jankowski, 2002). These initiatives are often funded from within the community, volunteer run and responding to the demands of the local population (Gaved & Anderson, 2006). While they may be set up and run for a variety of motivations (Bina & Giaglis, 2006), their initiators often claim that the self-organisation makes them more sustainable in the long term than externally initiated projects: “the very fact that the project is not dependent on external money means that there is nothing to run out of” (Davies 2004). In many cases the funding model is more complex, with partnerships and reciprocal relationships supporting local activity, however there is usually an emphasis on local control and management.

Self-organised network communities have been less well researched than externally initiated networks (Gaved & Mulholland, 2005), however it is clear that they are not homogenous, and offer lessons that can be carried forward. Self-organised network communities are usually seen as being more in touch with local community aspirations and goals. As the organizers are within the community, ownership is seen as being held within and more accountable to the residents. Ongoing as well as set-up support is considered of great importance (Williams 2005), as is local training, and the opportunity to sustain the network through the gradual training of users – peripheral participation (Lave and Wenger 1991).

Multiple subcultures are seen within the users of self-organised network communities; while Dunbar (1996) notes that communities over 150 people may fragment it is clear that on an even smaller level there will be different groupings within a neighbourhood, and it is unlikely that the community network will draw participation from all users (Foth, 2006a). Only in times of crisis might there be widespread participation, similar to that seen in Netville when the network itself was found to be on the point of closing down (Hampton, 2003). Similarly, it is unlikely that every member of the neighbourhood will participate; while self-organised community networks often seek 100% participation within the neighbourhood, there will be non-participants (Preece *et al.*, 2004; Selwyn, 2003). Critical mass of usage, however, is a significant issue (Damsgaard, 2000), as with externally initiated networks (Wright, 2005), if the community network is to be of widespread use as a community communication medium.

All tools and services are likely to be appropriated and may not be used as designed, however there may be varying rates of success. It is likely that some tools provided within the network may not be used at all and an iterative implementation process is required. The Redbricks community network in Manchester started with a large variety of tools including music and video sharing (Skyva 2002) but have reduced these services to two email lists, ‘Shout’ for calls to the whole community and ‘Act’ for political issues. Davies (2004) suggests that the most effective tools within a community network are those that offer non-critical services that help to build social capital, such as baby sitting services. Basic recommendation services such as local noticeboards, buy-and-sell may be more effective than highly developed services.

Self-organising network communities appear to be more socially sustainable due to their locally initiated nature, however they may struggle with financial and technical sustainability. Just as it is important to reach a critical mass of users of the network to

ensure their value as a shared community resource (Fulk *et al.*, 1996), so it is important to ensure a critical mass of volunteers with the necessary skills and expertise to support and develop the network. Small self-organising network communities may struggle to maintain the level of expertise required and benefit from participation in social networks of similar groups, for example the Community Broadband Network² in the UK (mainly focused on rural network groups), or NYCWireless³ in the USA (aimed at wireless network groups in New York City and the surrounding areas).

It is clear that self-organised community networks have both strengths and weaknesses, as have externally initiated networks, and we now turn to consider how these findings may inform a new partnership based network community that is being developed in Australia.

4 Master-Planned Communities

Many new urban developments are systematically planned and rapidly built and marketed, trying to create instant 'communities' in dense concentrations. In Hong Kong for example, new high-rise residential developments create instant concentrations of up to 10,000 people per apartment precinct (Forrest *et al.*, 2002). Developers and governments around the world struggling to achieve socially sustainable neighbourhood communities in these urban contexts, are increasingly considering the role of ICT to help animate master-planned communities (Foth, 2006c).

Gleeson (2004) gives examples of the prevailing attitude of developers who confuse 'planning for community' with 'master-planning community' and the associated negative impact on community development efforts. "Community development involves human horticulture, rather than social engineering" (Gilchrist, 2000, p. 269). The Kelvin Grove Urban Village (www.kgurbanvillage.com.au) is a master-planned residential development in inner-city Brisbane that seeks to learn from these and other lessons.

Queensland University of Technology and the Queensland Government's Department of Housing have established a strong partnership to develop the Kelvin Grove Urban Village (KGUV), an integrated master-planned urban renewal project. They have identified the KGUV as a distinct planning and design case study that departs from homogeneous planning principles. It reflects a desire to achieve a higher level of integration of population diversity (i.e. 'mainstream' accommodation and affordable housing) as well as residential, commercial, educational, cultural and employment facilities and activities (cf. Gleeson, 2004; Healy & Birrell, 2004). The objective to create a vibrant place of mixed uses and diverse population is reflected in the KGUV vision statement: "A diverse city fringe community linking learning with enterprise, creativity with community and unique living solutions with public amenity [...] creating a new part of Brisbane" (KGUV Master Plan 2004). The assembling of this site from existing and new entities provides a unique case study to explore

² <http://www.broadband-uk.coop/>

³ <http://www.nycwireless.net/>

innovative ways of fostering a sense of community and belonging with people who are collocated to live, work, study and play.

Research is underway to examine issues of socio-cultural sustainability in the experience of residents settling into a new environment. The Department of Housing breaks down the concept of urban sustainability into the 'triple bottom line' (Gleeson *et al.*, 2004, p. 353) of environmental, economic and social sustainability. This research project focuses on the social component as per the interpretation by Buys *et al.* (2005). Drawing on the findings of Foth (2004) in this context, it engages a tripartite approach comprising community capacity building strategies (the *people* dimension), a theory of neighbourhood identity based on 'networked individualism' (Wellman, 2001) (the *place* dimension), and design of online community networks (the *technology* dimension). These three components are inter-related. The study thus employs an inclusive approach that seeks to overcome any tendencies to ignore key factors in the design and development of meaningful ICT applications for residential communities.

The provision and implementation of the technical network infrastructure at the KGUV seeks to prepare the site to play an important part of Queensland's emerging knowledge economy. It is designed to enable people to work where they choose to live, connecting them with the world, and encouraging intellectual growth. The local network is supposed to create opportunities to integrate work and home life through highspeed, global communication systems for both businesses and residents. Common service ICT ducts have been installed beneath the footpaths in the KGUV, giving the potential to offer residents, home workers and business operators' broadband access to the Internet, high-speed transmission between local stakeholders of the KGUV, and high quality telephone and audiovisual services. A commercial provider has been contracted to provide for the next generation in technology that may operate across both terrestrial and wireless networks.

However, the KGUV project team has started to translate the lessons learnt from the studies referred to above into action. They have realized that it requires more than the provision and installation of wires, pipes and ducts to achieve a socially sustainable urban village community. We briefly outline three key strategies which seek to distinguish this initiative from the pitfalls of previous projects.

First, the provision of ICT systems and related services is designed with an exit strategy in mind right from the start to ensure the main financial assistance from the main project stakeholders is made continuously redundant over time. The vision of the KGUV as a smart neighbourhood and inclusive community is driven by a range of community development activities, and the KGUV Community Association is one of the key initiatives. The KGUV Community Association will be established by the Department of Housing and Queensland University of Technology. KGUV residents represent the main group of prospective members of the Community Association. Whilst the mission and business plan of the Community Association is distinct from the KGUV Principal Body Corporate, both entities are established to ensure the medium and long-term economic and social sustainability and governance of the KGUV. The KGUV Community Association will be a commercial entity which develops, markets and sells creative industries services. The main asset of the KGUV Community Association will be the KGUV Community Portal which is currently

being developed by a commercial web development company and which will eventually be maintained and managed by the association.

Secondly, the theoretical and methodological frameworks underpinning the project's research and development are based on principles of inclusiveness. In order to avoid considering a newly provided community network system in isolation, KGUV invokes the concept of 'communicative ecology' which we define as a milieu of agents who are connected in various ways by various media making. This notion integrates the three dimensions of 'online and offline', 'global and local' and 'collective and networked' (Foth & Hearn, 2006, forthcoming). This more holistic model helps us better appreciate the dynamic inter-relationships between different communication technologies and between different social dimensions found in the interactions of KGUV residents. It informs the creation of gateways and interfaces between existing social networks and communication systems on the one hand and the new KGUV Community Portal as a local communication hub on the other. Furthermore, network action research (Foth, 2006b) is used as a project methodology to reciprocally inform research and practice and to encourage community members as reflective practitioners in order to encourage community ownership of the initiative.

Thirdly, the project group has recognised the need to not only ensure network access but also effective use of the network by KGUV residents and other stakeholders. The KGUV Community Portal aims at facilitating community uptake of ICT by hosting entertainment and information content that encourages exploration of the ICT infrastructure available at the KGUV. Furthermore, the portal offers an outlet for self-published local community information and content which is intended to provide an online mechanism to link the people and businesses that live, learn, work and play at KGUV. It is supposed to encourage participation in the KGUV by being not only a key information resource of the diverse mix of activities, programs and facilities available, but also a communication hub. Additionally, the portal will be designed without a heavy reliance on maintaining a critical mass of users by focusing less on collective communication features such as discussion boards and more on peer-to-peer modes of interaction. Such features that can be a spring board to animate interaction which is then continued through external applications and devices such as instant messaging software and mobile phones will prove to be less high-maintenance than trying to draw all residents collectively to an online space which cannot fulfil the range of social needs and purposes that residents hold (Foth, 2006a).

The research, design and development of the ICT component and social sustainability aspects of the KGUV has started early 2006. The research design, background and progress to date have been outlined elsewhere (Foth, 2006c; Foth & Adkins, 2006). Evaluation strategies as part of the action research cycles will show whether the three broad strategies and principles discussed above make a significant difference in achieving a sustainable community network for KGUV residents.

5 Conclusions

In this paper we have described a variety of types of community network, and it can be seen that both externally funded and self-organised networks have shown both

advantages and weaknesses. We have considered lessons learnt from these community networks, and introduced a new partnership based initiative, The Kelvin Grove Urban Village, which seeks to build on the insights gathered.

We identify the following three key recommendations for KGUV, and future community networks:

- **Cultivate a sense of ownership:** Community networks that are felt to be part of the community's own assets are those that are best supported and most socially sustainable in the long term. We recommend connecting internal and external interests and resources through a theoretical framework and methodological approach which combines research and practice, considers existing and emerging local social structures, and encourages community members as co-investigators.
- **Simple, open ended tools are the most successful:** Highly complex tools may be little used and too alien to be domesticated by the community. Simple tools that allow informal social dialogue have proved to be more successful. As well, it is not unreasonable not to try to connect everyone with everyone else. Peer-to-peer modes of communication are more conducive to support the interaction in place-based social networks than collective, broadcast-style tools alone which require a constant critical mass of users to maintain momentum.
- **Develop externally initiated networks with an exit strategy in mind:** All users require technical support at some stage. Encouraging peripheral participation through buddying new users with expert users, providing online community help boards, informal and formal training will enable ongoing usage of the service and develop technical and managerial staff.

Clearly further research is required, and data gathered from KGUV will be valuable and reported in future papers. It is highly likely that more partnerships of this kind will be developed (in the UK for example the Oakgrove Millenium Community of 1850 wired houses is due to be occupied from early 2007) and the experiences of such urban wired new communities are likely to inform both digital divide policy and community informatics research in the future.

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